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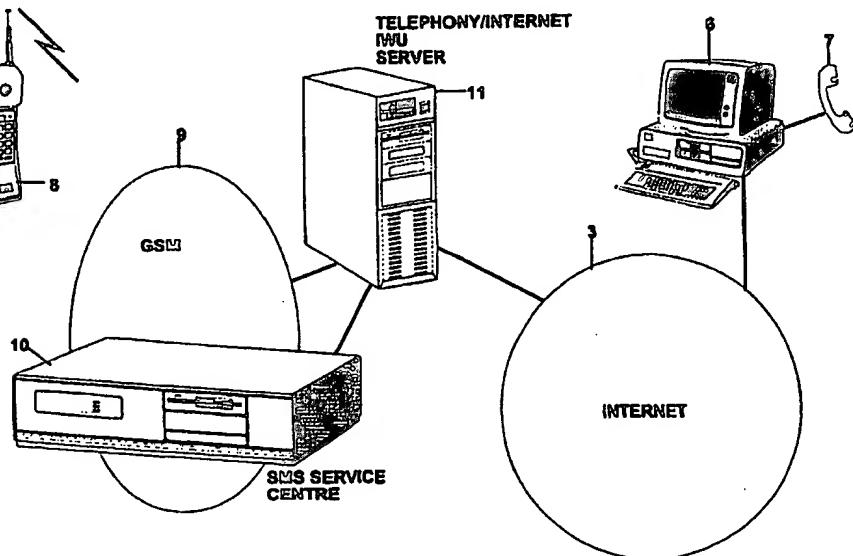
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(54) Title: COMMUNICATION SYSTEM INCLUDING MEANS FOR TRANSMITTING INTERNET ADDRESSES VIA SMS



(57) Abstract

The invention provides a communication system, adapted to establish connections to, and between, Internet users, including a cellular radio communication network adapted to provide a short message service (SMS), and a server adapted to facilitate the establishment of a telephony/Internet connection between a mobile subscriber station of said network and an Internet user. SMS is used to transfer, from the mobile subscriber station to the server, information identifying the Internet address for the Internet user and, from the server to the mobile subscriber station, information relating to the required connection between the mobile subscriber station and the Internet user.

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Communication system including means for
transmitting internet addresses via SMS

The invention relates to a communication system including a cellular radio communication network, such as a Global System for Mobile Communication (GSM) network, that is adapted to enable a GSM subscriber to make an Internet telephone call to an Internet user. In particular, a 'short message service' (SMS) is used to transfer address information for the Internet user to an Internet server. The invention also relates to a method for enabling a GSM subscriber to make an Internet telephone call to an Internet user using SMS to transfer address information for the Internet user.

10

It is highly probable that, within a few years, a very large proportion of the population of, for example, Sweden, will use the Internet in their day-to-day activities for a number of purposes, including, *inter alia*:

15

- entertainment;
- electronic shopping/banking;
- retrieving information in respect of a wide range of subject matter;
- as an information bank; and
- person-to-person communication.

20

At the present time, e-mail is the major Internet application, but it would clearly be of advantage to telephone subscribers if Internet telephony became, in the long term, a readily available subscriber service for personal communication. Forecasts envisage that Internet traffic, as compared with present day levels, could be increased many times by telephony. For a telephone operator, this is a development which, although it could 30 reduce revenues, will give rise to major developments in, and/or opportunities for, new subscriber services.

At the present time, a number of different Internet telephony solutions are

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currently available and in commercial operation.

The main advantage of known Internet telephony services is that the cost of long-distance calls can be considerably reduced. This cost reduction is effected by using local access points for the telephone calls and by using the Internet for the long-range transportation/transmission of telephone traffic. Services already launched include, inter alia:

- 5 - telephony from Internet-connected users to PSTN (Public Switched Telephone Network) subscribers, in which the PSTN subscriber is called by a local interworking server;
- 10 - a service in which both A-subscribers and B-subscribers are PSTN-connected to local servers which have contact with each other via the Internet - it will be seen from the subsequent description of the present invention that, in the longer term, it will also be able to transmit speech via GSM in the same manner.
- 15

The mobile cellular radio communication network, known as GSM, which is 20 covered by standards developed and promulgated by the European Telecommunications Standards Institute (ETSI), offers a variety of services to users, other than voice, including, inter alia, data services, short message services, and broadcast services. The 25 ETSI GSM Standards specify, in addition to the radio interface, a complete telecommunications network with radio access by the user. Since the architecture, and operational aspects, of GSM are well known to persons skilled in the art, only those aspects of GSM which are of direct relevance to the present invention will be described in this patent specification.

Thus, a GSM mobile connection is distinguished from a conventional PSTN 30 connection in that the mobile station, apart from having access to speech services, can access a short message service (SMS).

SMS is a feature which is incorporated into digital mobile telephone networks,

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and can be divided into two types, point-to-point services (SMS-PP), and broadcast services (SMS-CB).

5 SMS-PP allows a brief message (up to 160 characters) to be sent between a mobile telephone and a Service Centre (SC). Larger messages can optionally be created by concatenating multiple messages (the protocol allows up to 10 messages to be concatenated in this way). The SC is adapted to send, or receive, messages from a wide variety of sources, in addition to a GSM mobile telephone, for example, fax, normal telephone, dial up modems, public, or private data networks etc.. This means
10 that the service is not limited to sending messages between GSM mobile telephones, but can be used to send, or receive, messages from the wider telecommunications network.

15 An advantage of using SMS, in the present invention, is that it can be used by a GSM subscriber to establish a telephone connection to an Internet-connected user, without any additional equipment being necessary.

20 It is an object of the present invention to provide a communication system including a cellular radio communication network, such as a Global System for Mobile Communication (GSM) network, that is adapted to use a short message service (SMS) to enable a GSM subscriber to make an Internet telephone call to an Internet user. In particular, SMS is used to transfer address information for the Internet user to an Internet server.

25 It is another object of the present invention to provide a method for enabling a GSM subscriber to make an Internet telephone call to an Internet user using SMS to transfer address information for the Internet user.

30 According to a first aspect of the present invention, there is provided, a communication system adapted to establish connections to, and between, Internet users, characterised in that said communication system includes a cellular radio communication network adapted to provide a short message service (SMS), and a server adapted to facilitate the establishment of a telephony/Internet connection between a mobile subscriber station of said network and an Internet user, and said SMS is adapted

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to transfer, from said mobile subscriber station to said server, information identifying the Internet address for said Internet user; and, from said server to said mobile subscriber station, information relating to said connection between said mobile subscriber station and said Internet user.

5

SMS may be used to transfer the following information to said telephony/Internet server:

10 (a) the Internet address for an Internet-connected computer terminal of said Internet user; and

(b) a specific identity for said mobile subscriber station, for example, a telephone number for said mobile subscriber station.

15 The telephony/Internet server may include analysing means for effecting, on receipt of said SMS-transferred information, an A-number analysis to determine the A-telephone number identity of said mobile subscriber station.

20 The telephony/Internet server may be adapted, in response to receipt of said SMS-transferred information from said mobile subscriber station, to send an SMS to said mobile subscriber station including the following information:

25 (a) that call connection to said Internet user is possible; and
(b) the server's telephone number.

30 The telephony/Internet server may be adapted, on receipt of a call from said mobile subscriber station, made using the server's telephone number, to identify said mobile subscriber station (calling party), associate the telephone call with the Internet address previously transferred to said server by said mobile subscriber station, and connect the telephone call to the Internet address.

The telephony/Internet server may be adapted to identify said mobile subscriber

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station (calling party) using said A-number analysing means. The Internet address may be associated with the A-telephone number of said mobile subscriber station for a specific period of time which is monitored by a system timer.

5 The telephony/internet server may be adapted to connect the telephone call either directly to the Internet address, or to the Internet address via at least one additional Internet server, a server at the end of this chain being adapted to provide Internet telephony services.

10 The telephony/internet server may include means for establishing and storing a list of Internet addresses for each mobile subscriber station user subscribing to the system, and each one of said Internet addresses may have an address list number.

15 The telephony/internet server may be adapted, in response to receipt of said SMS-transferred information from said mobile subscriber station, to send an SMS to said mobile subscriber station including the following information:

- (a) that call connection to said Internet user is possible;
- 20 (b) the server's telephone number; and
- (c) an address list number for the Internet address, each address list number corresponding to one of the Internet addresses in the mobile subscriber station user's address list in the telephony/internet server.

25 The address list numbers may be stored in a respective mobile subscriber station's telephone number list.

30 The mobile subscriber station may be adapted to request from said telephony/internet server, and said telephony/internet server may be adapted to supply to the mobile subscriber station, a complete listing of the Internet address list.

The mobile subscriber station may be adapted to search for a specific one of the

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Internet addresses stored by said telephony/Internet server.

The telephony/Internet server may be adapted, on receipt of a call connection request from a mobile subscriber station to an unlisted Internet address, to store, and assign an address list number to, the unlisted Internet address, and send back, to the mobile subscriber station, via SMS, the following information to enable a user of said mobile subscriber station to call said Internet address:

- (a) the assigned address list number;
- (b) the server's telephone number; and
- (c) information that call connection is possible to the Internet address.

According to a second aspect of the present invention, there is provided, a method for enabling a mobile subscriber station of a cellular radio communication network to make an Internet telephone call to an Internet user, characterised by the use of SMS to transfer, from said mobile subscriber station to a telephony/Internet server, information identifying the Internet address for said Internet user; and, from said telephony/Internet server to said mobile subscriber station, information relating to said connection between said mobile station and said Internet user. This method may be further characterised by said SMS being used to transfer the following information to said telephony/Internet server: the Internet address for an Internet-connected computer terminal of said Internet user; and a specific identity for said mobile subscriber station, for example, a telephone number for said mobile subscriber station.

The method may be characterised by said telephony/Internet server, on receipt of said SMS-transferred information, using A-number analysis to determine the A-telephone number identity of said mobile subscriber station.

The method may be characterised by said telephony/Internet server, in response to receipt of said SMS-transferred information from said mobile subscriber station, sending an SMS to said mobile subscriber station including the following information:

that call connection to said Internet user is possible; and the server's telephone number.

The method may be characterised by said mobile subscriber station calling the server's telephone number, and said server, on receipt of the call from said mobile subscriber station, identifying said mobile subscriber station (calling party), associating the telephone call with the Internet address previously transferred to said server by said mobile subscriber station, and connecting the telephone call to the Internet address. This method may be further characterised by said telephony/Internet server identifying said mobile subscriber station (calling party) using said A-number analysis.

10

The method may be characterised by associating said Internet address with the A-telephone number of said mobile subscriber station for a specific period of time, and by monitoring said period of time.

15

The method may be characterised by said telephony/Internet server connecting the telephone call either directly to the Internet address, or to the Internet address via at least one additional Internet server, a server at the end of this chain being adapted to provide Internet telephony services.

20

The method may be characterised by said telephony/Internet server establishing and storing a list of Internet addresses for each mobile subscriber station user wishing to make Internet telephone calls, and by each one of said Internet addresses having an address list number. This method may be further characterised by said telephony/Internet server, in response to receipt of said SMS-transferred information from said mobile subscriber station, sending an SMS to said mobile subscriber station including the following information: that call connection to said Internet user is possible, the server's telephone number, and an address list number for the Internet address, each address list number corresponding to one of the Internet addresses in the mobile subscriber station user's address list in the telephony/Internet server. This method may be further characterised by storing said address list numbers in a respective mobile subscriber station's telephone number list.

The method may be characterised by a mobile subscriber station requesting a

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complete listing of the Internet address list from said telephony/Internet server.

The method may be characterised by a mobile subscriber station searching for a specific one of the Internet addresses stored by said telephony/Internet server.

5

The method may be characterised by said telephony/Internet server, on receipt of a call connection request from a mobile subscriber station to an unlisted Internet address, storing, and assigning an address list number to, the unlisted Internet address; and by sending back, to the mobile subscriber station, via SMS, the following information 10 to enable a user of said mobile subscriber station to call said Internet address: the assigned address list number, the server's telephone number, and information that call connection is possible to the Internet address.

15

According to a third aspect of the present invention, there is provided, a method for enabling a mobile subscriber station of a cellular radio communication network to make an Internet telephone call to an Internet user, characterised by a user of said mobile subscriber station sending the following information to a telephony/Internet server using SMS: information identifying the Internet address for said Internet user, and the specific identity of said mobile subscriber station (for example, the telephone number for 20 the mobile subscriber station); said telephony/Internet server, in response to receipt of said information, sending an SMS to said mobile subscriber station, said SMS including the following information: that connection to said Internet address is possible, and the server's telephone number; a user of said mobile subscriber station, on receipt of the SMS from the server, calling the server's telephone number; and the server, on receipt 25 of the telephone call from the mobile subscriber station, identifying the calling party (mobile subscriber station) using, for example, A-number analysis, associating the telephone call with the Internet address previously received in the SMS from the mobile subscriber station; and connecting the telephone call to the Internet address.

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According to a fourth aspect of the present invention, there is provided, a method for enabling a mobile subscriber station of a cellular radio communication network to make an Internet telephone call to an Internet user, characterised by establishing and storing a list of Internet addresses for each mobile subscriber station user wishing to

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make Internet telephone calls; assigning, for each address in the Internet address list, a number which uniquely identifies these addresses; a user of said mobile subscriber station sending the following information to a telephony/Internet server using SMS: information identifying the Internet address for said Internet user, and the specific identity of said mobile subscriber station (for example, the telephone number for the mobile subscriber station); said telephony/Internet server, in response to receipt of said information, sending an SMS to said mobile subscriber station, said SMS including the following information: that connection to said Internet address is possible, the server's telephone number, and an address list number for the Internet address, each address list number corresponding to one of the Internet addresses in the mobile subscriber station user's address list in the telephony/Internet server; a user of said mobile subscriber station, on receipt of the SMS from the server, calling the server's telephone number, the telephony/Internet server, on receipt of the telephone call from the mobile subscriber station, transmitting a voice message to said mobile subscriber station requesting the user to key in an address list number; and, when said mobile subscriber station user keys in said address list number, said telephony/Internet server connecting the user of said mobile subscriber station to an Internet user at the Internet address corresponding to the address list number. This method may be further characterised by said telephony/Internet server, in the absence of a response from the Internet user, notifying the user of said mobile subscriber terminal by means of either a voice message, or tones, as in conventional telephony. This method may be further characterised by said notification being that the Internet user is engaged, or is not replying, or does not have an Internet telephony application.

25 The cellular radio communication network may be a GSM network.

The foregoing and other features of the present invention will be better understood from the following description with reference to the accompanying drawings, in which:

30

Figure 1 diagrammatically illustrates a communication system having a number of different Internet telephony arrangements; and

- 10 -

Figure 2 diagrammatically illustrates a communication system according to the present invention.

It will be seen from the communication system, which is diagrammatically 5 illustrated in Figure 1 of the accompany drawings, that:

(a) PSTN subscriber telephones 1 and 2, are respectively connectd to the Internet 3 via Telephony/Internet IWU (InterWorking Unit) Servers 4 and 5; and

10 (b) Internet users are connected to the Internet 3 by means of a user terminal 6 which is, in essence, a computer terminal, such as a personal computer, with a display screen and having a telephone handset 7 connected thereto. The Internet user terminal 6 is connected to the Internet 3 via a modem (not illustrated) and includes appropriate Internet software for facilitating the 15 establishment of a connection to, and interaction with, the Internet 3.

In practice, a PSTN subscriber telephone, in Figure 1, could be replaced by a 20 GSM mobile station/handset and a GSM network, in which case, a MSC (Mobile Switching Centre) of the GSM network would be directly connected to an Internet server via 64 kbps PCM (Pulse Code Modulation).

The manner in which telephone calls are established, via the Internet 3, between 25 the PSTN subscriber telephones 1 and 2 and/or between the Internet user terminal 6 and a PSTN subscriber telephone 1 or 2, is well known to persons skilled in the art and will not, therefore, be addressed, in great detail, by this patent specification.

In order to be able to interconnect speech to an Internet telephony user, via 30 GSM, or conventional PSTN, it is necessary to have a coder which is adapted to re-code the PCM-coded speech data flow and to send this over the Internet. Equipment for effecting this task is readily available from a number of manufacturers. These equipments are, however, primarily based on either PSTN-to-PSTN, or Internet-to-PSTN. These models are easier to solve than a telephone call which originates in the PSTN, or GSM speech service, and terminates in the Internet.

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The problem facing the GSM subscriber is how he/she is to address the Internet user without having access to an alphanumeric keyboard. The SMS service of GSM has an alphanumeric capability and can, therefore, be used for GSM/Internet telephony services.

5

If a B-subscriber (called party, or recipient) is PSTN-connected, the recipient's usual telephone number is specified on calling. Basically, by dialling the B-subscriber's telephone number, the Internet telephony server can connect to the Internet telephony server located nearest the B-subscriber and route the call to that server. The distant 10 server, i.e. local to the B-subscriber, then calls the B-subscriber, and a call connection can be established.

15 However, if a GSM subscriber (A-subscriber, or calling party) wishes to make telephone contact with a third party (B-subscriber, or called party) who does not have a 'conventional' telephone number, but is connected to the Internet, i.e. is an Internet user, the A-subscriber must specify the recipient's (called party's) 'Web Phone Number'. This 20 may be an Internet, or e-mail, address. It is difficult, if not impossible, to transfer this information from a GSM mobile station/handset, or from a conventional telephone, to the server. An Internet address, i.e. the IP (Internet Protocol) address, which is 12 digits 25 long, can certainly be transferred by DTMF (Dual Tone Multifrequency). However, if the calling party only has the e-mail address, i.e. a DNS (Domain Name System) address, and not the Internet address (IP address), for an Internet user he/she wishes to call, it is difficult, if not impossible, for the calling party to establish a connection to the Internet user. Thus, in these circumstances, it will be necessary for the Internet address to be 30 separately transferred to an Internet telephony server, and possibly also for a personal address list to be established in an Internet telephony server to which the user has a subscription. This can be effected, in accordance with the present invention, by using the GSM short message service (SMS), in a manner which will subsequently be described with reference to Figure 2 of the accompanying drawings.

30

It will be seen from Figure 2 of the accompanying drawings, which diagrammatically illustrates a communication system according to the present invention, that the Internet user terminal 6/telephone handset 7 combination of Figure 1 of the

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accompanying drawings, is also shown in Figure 2, together with a GSM mobile station/handset 8, GSM network 9, SMS Service Centre (SC) 10 and Telephony/Internet IWU Server 11 which is connected to the GSM network 9 and the SMS SC 10. The communication system of Figure 2 is adapted to connect a telephone call, originated by 5 the GSM mobile station 8, to a user of the Internet terminal 6 using SMS to facilitate the transfer of the Internet address for the user terminal 6.

Thus, when a GSM subscriber wishes to make an Internet telephone call, using 10 the mobile station 8, to an Internet-connected user, i.e. the user of the Internet user terminal 6, SMS is used to transfer the Internet address information, for the Internet user, to the Internet server 11 via the SMS Service Centre 10. With such an interconnection arrangement, several different scenarios are possible.

15 A first one of these scenarios, which provides the simplest solution, uses the GSM short message service (SMS) to transfer:

- the Internet address information from the GSM mobile station 8 to the Telephony/Internet IWU (InterWorking Unit) server 11; and
- 20 - from the server 11 to the GSM mobile station 8, information for effecting the establishment of a telephony/Internet telephony connection between the GSM mobile station 8 and an Internet user, i.e. information which identifies the server's telephone number and which informs the GSM subscriber that a connection to the Internet user is possible.

25

On receipt of this information, the GSM mobile station 8 can then connect a telephone call to the server 11, which associates the telephone call with the previously sent Internet address for the Internet user. In operation, the following are sent to the interworking server 11 via SMS:

30

- the Internet address to the destination computer, i.e. the Internet user terminal 6 of the called party; and

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- the specific identity, for example, the specific telephone number for the GSM subscriber - an A-number analysis can be used to obtain the specific identity, which is why it need not be stated in plain language in the SMS message.

5 The server 11 responds with an SMS - this SMS includes information that a connection to the Internet user (Internet address) is possible, together with the telephone number for the interworking server 11.

10 The GSM subscriber can then call the server's telephone number and, on receipt of this call, the server 11 can, via an A-number analysis (see above), associate the telephone call to the Internet address previously sent in the first SMS. In practice, the Internet address is associated with the GSM A-telephone number for a specific period of time which is monitored by a timer which forms part of the communication system. The server 11 thereafter connects the telephone call either directly to the Internet user, 15 or indirectly via at least one additional Internet server, a server at the end of this chain being adapted to provide Internet telephony services.

20 It will be seen, from the foregoing description of the first interconnection scenario, that a method, according to present invention, for enabling a mobile subscriber station of a cellular radio communication network to make an Internet telephone call to an Internet user, is characterised by the steps of:

25 (a) a user of said mobile subscriber station sending the following information to a telephony/Internet server using SMS:

- information identifying the Internet address for said Internet user; and

- the specific identity of said mobile subscriber station (for example, the telephone number for the mobile subscriber station);

30 (b) said telephony/Internet server, in response to receipt of said information, sending an SMS to said mobile subscriber station, said SMS including the following information:

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- that connection to the Internet address is possible; and
- the server's telephone number;

5 (c) a user of said mobile subscriber station, on receipt of the SMS from the server, calling the server's telephone number; and

(d) the server, on receipt of the telephone call from the mobile subscriber station:

10 - identifying the calling party (mobile subscriber station) using, for example, A-number analysis;

- associating the telephone call with the Internet address previously received in the SMS from the mobile subscriber station; and

15 - connecting the telephone call to the Internet address.

The advantages of this interconnection arrangement are that the Telephony/Internet server 11 does not need to know the identity of the GSM subscriber, 20 and no subscription is needed.

If a GSM operator is in possession of appropriate equipment, debiting charges for the telephone can be effected, in a manner known to persons skilled in the art, without any very serious problems.

25 Another one of the interconnection scenarios, which is a more advanced version of the first interconnection scenario, involves the establishment of an address list in the Internet telephony server 11. In this case, the GSM subscriber will have a subscription with an Internet telephony service provider.

30 This, more advanced, scenario uses the same SMS, as outlined above for the first scenarios, i.e. with the Internet address being sent to the destination computer and the specific identity to the server 11. The SMS reply contains, in addition to the

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telephone number to the server and information that call connection is possible, an address listing including the Internet address for the Internet user. Each address list number corresponds to one of the Internet addresses in the GSM subscriber's address list in the server. These numbers can be stored in the mobile subscriber telephone's 5 telephone number list.

In the event that a GSM subscriber forgets a number, the SMS procedure, as outlined above, can be effected in order to obtain the Internet address list number. The subscriber can also request a complete listing of the Internet address list, or search for 10 a specific letter.

It will be seen, from the foregoing description of the second interconnection scenario, that a method, according to present invention, for enabling a mobile subscriber station of a cellular radio communication network to make an Internet telephone call to 15 an Internet user, is characterised by the steps of:

(a) establishing and storing a list of Internet addresses for each mobile subscriber station user wishing to make Internet telephone calls;

20 (b) assigning, for each address in the Internet address list, a number which uniquely identifies these addresses;

(c) a user of said mobile subscriber station sending the following information to a 25 telephony/Internet server using SMS:

25
- information identifying the Internet address for said Internet user; and
- the specific identity of said mobile subscriber station (for example, the telephone number for the mobile subscriber station);

30 (d) said telephony/Internet server, in response to receipt of said information, sending an SMS to said mobile subscriber station, said SMS including the following information:

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- that connection to the Internet address is possible;
- the server's telephone number; and
- 5 - an address list number for the Internet address, each address list number corresponding to one of the Internet addresses in the mobile subscriber station user's address list in the telephony/Internet server;
- 10 (e) a user of said mobile subscriber station, on receipt of the SMS from the server, calling the server's telephone number;
- (f) the telephony/Internet server, on receipt of the telephone call from the mobile subscriber station, transmitting a voice message to said mobile subscriber station requesting the user to key in an address list number; and
- 15 - when said mobile subscriber station user keys in said address list number, said telephony/Internet server connects the user of said mobile subscriber station to an Internet user at the Internet address corresponding to the address list number; or
- 20 - said telephony/Internet server, in the absence of a response from the Internet user, notifying the user of said mobile subscriber terminal by means of either a voice message, or tones, as in conventional telephony, that the Internet user is engaged, or is not replying, or does not have an Internet telephony application.
- 25

The advantage of the second interconnection scenario is that:

- the service becomes more user-friendly; and
- 30 - a conventional telephone (not having access to an SMS facility) with a DMTF function can be used to call an Internet user if the address list number is known.

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In the case of the second, or more advanced scenario, outlined above, if a GSM subscriber has 32 addresses in his/her list and wants to connect a telephone call to a new address, then the following procedure would have to be effected:

5 (1) The GSM subscriber sends a call connect request, together with an enquiry about the Internet address's address list number in the server 11.

SMS: <internet address> (12 digits, or e-mail address)

10 (2) The server 11 stores the new address in the address list and sends back, to the GSM subscriber, the address list number, telephone number, and information that coupling is possible.

15 SMS: coupling to <internet address> is OK! Call
<server telephone number>[pause]<address list number#>
(list number in this case would be 33#, or the first vacant one)

20 (3) The GSM subscriber can now call the server's telephone number. On receipt of a call from the GSM subscriber, the server transmits a voice message requesting the user (by DMTF) to key in an address list number. On some GSM-compatible mobile stations/telephones, for example, the Ericsson GH388, a DMTF string can be added to the telephone number, after a pause symbol, before the connection is made. A telephone number sent by the server in SMS would then appear as follows: 0705110646p33#.

25 When the GSM subscriber has dialled the number and the address list number, the server 11 establishes an Internet connection to the destination address (possibly via at least one additional Internet telephony server, as outlined above). If the Internet user does not reply, the GSM subscriber is notified via either a speech message, or tones.

30 as in conventional telephony. A notification message may be that the Internet user:

- is engaged;

- 18 -

- is not replying; or
- does not have an Internet telephony application.

5 As an alternative to SMS, the GSM service 'Alternate Speech/Data' could be used. The advantages of this alternative are that only one call coupling is required. With this alternative arrangement, the telephone call is initiated through data transfer of the Internet address to the server 11 from the mobile station/handset 8, after which the server 11 can connect the connection to the Internet party. The GSM access then connects over the speech, and the call can take place. The disadvantage of this solution
10 is that data terminal functionality is required, for example, a computer, or advanced GSM mobile terminal, for example, the Nokia Communicator 9000 type. Note that this is not necessary if SMS is used as data carrier.

15 It will be seen from the foregoing description that the present invention relates to the manner in which a GSM subscriber can connect an Internet telephone call through the IP (Internet Protocol) address information being transferred via SMS and can, therefore, be used for an Internet telephony service based on GSM's speech service access. The use of the short message service (SMS), available in a mobile telephone
20 terminal, to transfer an Internet address, or e-mail address with alphanumeric symbols, means that no additional equipment is required, such as, for example, a portable computer, to transfer Internet telephony calls to an Internet-connected called party.

25

30

CLAIMS

1. A communication system adapted to establish connections to, and between, Internet users, characterised in that said communication system includes a cellular radio communication network adapted to provide a short message service (SMS), and a server adapted to facilitate the establishment of a telephony/Internet connection between a mobile subscriber station of said network and an Internet user, and in that said SMS is adapted to transfer:

5 10 - from said mobile subscriber station to said server, information identifying the Internet address for said Internet user; and

- from said server to said mobile subscriber station, information relating to said connection between said mobile subscriber station and said Internet user.

15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145 150 155 160 165 170 175 180 185 190 195 200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295 300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395 400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495 500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595 600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695 700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795 800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895 900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995 1000 1005 1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 1065 1070 1075 1080 1085 1090 1095 1100 1105 1110 1115 1120 1125 1130 1135 1140 1145 1150 1155 1160 1165 1170 1175 1180 1185 1190 1195 1200 1205 1210 1215 1220 1225 1230 1235 1240 1245 1250 1255 1260 1265 1270 1275 1280 1285 1290 1295 1300 1305 1310 1315 1320 1325 1330 1335 1340 1345 1350 1355 1360 1365 1370 1375 1380 1385 1390 1395 1400 1405 1410 1415 1420 1425 1430 1435 1440 1445 1450 1455 1460 1465 1470 1475 1480 1485 1490 1495 1500 1505 1510 1515 1520 1525 1530 1535 1540 1545 1550 1555 1560 1565 1570 1575 1580 1585 1590 1595 1600 1605 1610 1615 1620 1625 1630 1635 1640 1645 1650 1655 1660 1665 1670 1675 1680 1685 1690 1695 1700 1705 1710 1715 1720 1725 1730 1735 1740 1745 1750 1755 1760 1765 1770 1775 1780 1785 1790 1795 1800 1805 1810 1815 1820 1825 1830 1835 1840 1845 1850 1855 1860 1865 1870 1875 1880 1885 1890 1895 1900 1905 1910 1915 1920 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080 2085 2090 2095 2100 2105 2110 2115 2120 2125 2130 2135 2140 2145 2150 2155 2160 2165 2170 2175 2180 2185 2190 2195 2200 2205 2210 2215 2220 2225 2230 2235 2240 2245 2250 2255 2260 2265 2270 2275 2280 2285 2290 2295 2300 2305 2310 2315 2320 2325 2330 2335 2340 2345 2350 2355 2360 2365 2370 2375 2380 2385 2390 2395 2400 2405 2410 2415 2420 2425 2430 2435 2440 2445 2450 2455 2460 2465 2470 2475 2480 2485 2490 2495 2500 2505 2510 2515 2520 2525 2530 2535 2540 2545 2550 2555 2560 2565 2570 2575 2580 2585 2590 2595 2600 2605 2610 2615 2620 2625 2630 2635 2640 2645 2650 2655 2660 2665 2670 2675 2680 2685 2690 2695 2700 2705 2710 2715 2720 2725 2730 2735 2740 2745 2750 2755 2760 2765 2770 2775 2780 2785 2790 2795 2800 2805 2810 2815 2820 2825 2830 2835 2840 2845 2850 2855 2860 2865 2870 2875 2880 2885 2890 2895 2900 2905 2910 2915 2920 2925 2930 2935 2940 2945 2950 2955 2960 2965 2970 2975 2980 2985 2990 2995 3000 3005 3010 3015 3020 3025 3030 3035 3040 3045 3050 3055 3060 3065 3070 3075 3080 3085 3090 3095 3100 3105 3110 3115 3120 3125 3130 3135 3140 3145 3150 3155 3160 3165 3170 3175 3180 3185 3190 3195 3200 3205 3210 3215 3220 3225 3230 3235 3240 3245 3250 3255 3260 3265 3270 3275 3280 3285 3290 3295 3300 3305 3310 3315 3320 3325 3330 3335 3340 3345 3350 3355 3360 3365 3370 3375 3380 3385 3390 3395 3400 3405 3410 3415 3420 3425 3430 3435 3440 3445 3450 3455 3460 3465 3470 3475 3480 3485 3490 3495 3500 3505 3510 3515 3520 3525 3530 3535 3540 3545 3550 3555 3560 3565 3570 3575 3580 3585 3590 3595 3600 3605 3610 3615 3620 3625 3630 3635 3640 3645 3650 3655 3660 3665 3670 3675 3680 3685 3690 3695 3700 3705 3710 3715 3720 3725 3730 3735 3740 3745 3750 3755 3760 3765 3770 3775 3780 3785 3790 3795 3800 3805 3810 3815 3820 3825 3830 3835 3840 3845 3850 3855 3860 3865 3870 3875 3880 3885 3890 3895 3900 3905 3910 3915 3920 3925 3930 3935 3940 3945 3950 3955 3960 3965 3970 3975 3980 3985 3990 3995 4000 4005 4010 4015 4020 4025 4030 4035 4040 4045 4050 4055 4060 4065 4070 4075 4080 4085 4090 4095 4100 4105 4110 4115 4120 4125 4130 4135 4140 4145 4150 4155 4160 4165 4170 4175 4180 4185 4190 4195 4200 4205 4210 4215 4220 4225 4230 4235 4240 4245 4250 4255 4260 4265 4270 4275 4280 4285 4290 4295 4300 4305 4310 4315 4320 4325 4330 4335 4340 4345 4350 4355 4360 4365 4370 4375 4380 4385 4390 4395 4400 4405 4410 4415 4420 4425 4430 4435 4440 4445 4450 4455 4460 4465 4470 4475 4480 4485 4490 4495 4500 4505 4510 4515 4520 4525 4530 4535 4540 4545 4550 4555 4560 4565 4570 4575 4580 4585 4590 4595 4600 4605 4610 4615 4620 4625 4630 4635 4640 4645 4650 4655 4660 4665 4670 4675 4680 4685 4690 4695 4700 4705 4710 4715 4720 4725 4730 4735 4740 4745 4750 4755 4760 4765 4770 4775 4780 4785 4790 4795 4800 4805 4810 4815 4820 4825 4830 4835 4840 4845 4850 4855 4860 4865 4870 4875 4880 4885 4890 4895 4900 4905 4910 4915 4920 4925 4930 4935 4940 4945 4950 4955 4960 4965 4970 4975 4980 4985 4990 4995 5000 5005 5010 5015 5020 5025 5030 5035 5040 5045 5050 5055 5060 5065 5070 5075 5080 5085 5090 5095 5100 5105 5110 5115 5120 5125 5130 5135 5140 5145 5150 5155 5160 5165 5170 5175 5180 5185 5190 5195 5200 5205 5210 5215 5220 5225 5230 5235 5240 5245 5250 5255 5260 5265 5270 5275 5280 5285 5290 5295 5300 5305 5310 5315 5320 5325 5330 5335 5340 5345 5350 5355 5360 5365 5370 5375 5380 5385 5390 5395 5400 5405 5410 5415 5420 5425 5430 5435 5440 5445 5450 5455 5460 5465 5470 5475 5480 5485 5490 5495 5500 5505 5510 5515 5520 5525 5530 5535 5540 5545 5550 5555 5560 5565 5570 5575 5580 5585 5590 5595 5600 5605 5610 5615 5620 5625 5630 5635 5640 5645 5650 5655 5660 5665 5670 5675 5680 5685 5690 5695 5700 5705 5710 5715 5720 5725 5730 5735 5740 5745 5750 5755 5760 5765 5770 5775 5780 5785 5790 5795 5800 5805 5810 5815 5820 5825 5830 5835 5840 5845 5850 5855 5860 5865 5870 5875 5880 5885 5890 5895 5900 5905 5910 5915 5920 5925 5930 5935 5940 5945 5950 5955 5960 5965 5970 5975 5980 5985 5990 5995 6000 6005 6010 6015 6020 6025 6030 6035 6040 6045 6050 6055 6060 6065 6070 6075 6080 6085 6090 6095 6100 6105 6110 6115 6120 6125 6130 6135 6140 6145 6150 6155 6160 6165 6170 6175 6180 6185 6190 6195 6200 6205 6210 6215 6220 6225 6230 6235 6240 6245 6250 6255 6260 6265 6270 6275 6280 6285 6290 6295 6300 6305 6310 6315 6320 6325 6330 6335 6340 6345 6350 6355 6360 6365 6370 6375 6380 6385 6390 6395 6400 6405 6410 6415 6420 6425 6430 6435 6440 6445 6450 6455 6460 6465 6470 6475 6480 6485 6490 6495 6500 6505 6510 6515 6520 6525 6530 6535 6540 6545 6550 6555 6560 6565 6570 6575 6580 6585 6590 6595 6600 6605 6610 6615 6620 6625 6630 6635 6640 6645 6650 6655 6660 6665 6670 6675 6680 6685 6690 6695 6700 6705 6710 6715 6720 6725 6730 6735 6740 6745 6750 6755 6760 6765 6770 6775 6780 6785 6790 6795 6800 6805 6810 6815 6820 6825 6830 6835 6840 6845 6850 6855 6860 6865 6870 6875 6880 6885 6890 6895 6900 6905 6910 6915 6920 6925 6930 6935 6940 6945 6950 6955 6960 6965 6970 6975 6980 6985 6990 6995 7000 7005 7010 7015 7020 7025 7030 7035 7040 7045 7050 7055 7060 7065 7070 7075 7080 7085 7090 7095 7100 7105 7110 7115 7120 7125 7130 7135 7140 7145 7150 7155 7160 7165 7170 7175 7180 7185 7190 7195 7200 7205 7210 7215 7220 7225 7230 7235 7240 7245 7250 7255 7260 7265 7270 7275 7280 7285 7290 7295 7300 7305 7310 7315 7320 7325 7330 7335 7340 7345 7350 7355 7360 7365 7370 7375 7380 7385 7390 7395 7400 7405 7410 7415 7420 7425 7430 7435 7440 7445 7450 7455 7460 7465 7470 7475 7480 7485 7490 7495 7500 7505 7510 7515 7520 7525 7530 7535 7540 7545 7550 7555 7560 7565 7570 7575 7580 7585 7590 7595 7600 7605 7610 7615 7620 7625 7630 7635 7640 7645 7650 7655 7660 7665 7670 7675 7680 7685 7690 7695 7700 7705 7710 7715 7720 7725 7730 7735 7740 7745 7750 7755 7760 7765 7770 7775 7780 7785 7790 7795 7800 7805 7810 7815 7820 7825 7830 7835 7840 7845 7850 7855 7860 7865 7870 7875 7880 7885 7890 7895 7900 7905 7910 7915 7920 7925 7930 7935 7940 7945 7950 7955 7960 7965 7970 7975 7980 7985 7990 7995 8000 8005 8010 8015 8020 8025 8030 8035 8040 8045 8050 8055 8060 8065 8070 8075 8080 8085 8090 8095 8100 8105 8110 8115 8120 8125 8130 8135 8140 8145 8150 8155 8160 8165 8170 8175 8180 8185 8190 8195 8200 8205 8210 8215 8220 8225 8230 8235 8240 8245 8250 8255 8260 8265 8270 8275 8280 8285 8290 8295 8300 8305 8310 8315 8320 8325 8330 8335 8340 8345 8350 8355 8360 8365 8370 8375 8380 8385 8390 8395 8400 8405 8410 8415 8420 8425 8430 8435 8440 8445 8450 8455 8460 8465 8470 8475 8480 8485 8490 8495 8500 8505 8510 8515 8520 8525 8530 8535 8540 8545 8550 8555 8560 8565 8570 8575 8580 8585 8590 8595 8600 8605 8610 8615 8620 8625 8630 8635 8640 8645 8650 8655 8660 8665 8670 8675 8680 8685 8690 8695 8700 8705 8710 8715 8720 8725 8730 8735 8740 8745 8750 8755 8760 8765 8770 8775 8780 8785 8790 8795 8800 8805 8810 8815 8820 8825 8830 8835 8840 8845 8850 8855 8860 8865 8870 8875 8880 8885 8890 8895 8900 8905 8910 8915 8920 8925 8930 8935 8940 8945 8950 8955 8960 8965 8970 8975 8980 8985 8990 8995 9000 9005 9010 9015 9020 9025 9030 9035 9040 9045 9050 9055 9060 9065 9070 9075 9080 9085 9090 9095 9100 9105 9110 9115 9120 9125 9130 9135 9140 9145 9150 9155 9160 9165 9170 9175 9180 9185 9190 9195 9200 9205 9210 9215 9220 9225 9230 9235 9240 9245 9250 9255 9260 9265 9270 9275 9280 9285 9290 9295 9300 9305 9310 9315 9320 9325 9330 9335 9340 9345 9350 9355 9360 9365 9370 9375 9380 9385 9390 9395 9400 9405 9410 9415 9420 9425 9430 9435 9440 9445 9450 9455 9460 9465 9470 9475 9480 9485 9490 9495 9500 9505 9510 9515 9520 9525 9530 9535 9540 9545 9550 9555 9560 9565 9570 9575 9580 9585 9590 9595 9600 9605 9610 9615 9620 9625 9630 9635 9640 9645 9650 9655 9660 9665 9670 9675 9680 9685 9690 9695 9700 9705 9710 9715 9720 9725 9730 9735 9740 9745 9750 9755 9760 9765 9770 9775 9780 9785 9790 9795 9800 9805 9810 9815 9820 9825 9830 9835 9840 9845 9850 9855 9860 9865 9870 9875 9880 9885 9890 9895 9900 9905 9910 9915 9920 9925 9930 9935 9940 9945 9950 9955 9960 9965 9970 9975 9980 9985 9990 9995 9999

- 20 -

said telephony/Internet server is adapted, in response to receipt of said SMS-transferred information from said mobile subscriber station, to send an SMS to said mobile subscriber station including the following information:

5 - that call connection to said Internet user is possible; and
 - the server's telephone number.

10 6. A communication system as claimed in claim 5, characterised in that said telephony/Internet server is adapted, on receipt of a call from said mobile subscriber station, made using the server's telephone number, to:

- identify said mobile subscriber station (calling party);
- 15 - associate the telephone call with the Internet address previously transferred to said server by said mobile subscriber station; and
- connect the telephone call to the Internet address.

20 7. A communication system as claimed in claim 6, when appended to either claim 4, or claim 5, characterised in that said telephony/Internet server is adapted to identify said mobile subscriber station (calling party) using said A-number analysing means.

25 8. A communication system as claimed in claim 7, characterised in that said Internet address is associated with the A-telephone number of said mobile subscriber station for a specific period of time which is monitored by a system timer.

30 9. A communication system as claimed in any of claims 6 to 8, characterised in that said telephony/Internet server is adapted to connect the telephone call directly to the Internet address.

10. A communication system as claimed in any of claims 6 to 8, characterised in that said telephony/Internet server is adapted to connect the telephone call to the Internet

- 21 -

address via at least one additional Internet server, a server at the end of this chain being adapted to provide Internet telephony services.

11. A communication system as claimed in any preceding claim, characterised in that
5 said telephony/Internet server includes means for establishing and storing a list of Internet addresses for each mobile subscriber station user subscribing to the system, and in that each one of said Internet addresses has an address list number.

12. A communication system as claimed in claim 11, characterised in that said
10 telephony/Internet server is adapted, in response to receipt of said SMS-transferred information from said mobile subscriber station, to send an SMS to said mobile subscriber station including the following information:

- 15 - that call connection to said Internet user is possible;
- the server's telephone number; and
- an address list number for the Internet address, each address list number corresponding to one of the Internet addresses in the mobile subscriber station
20 user's address list in the telephony/Internet server.

13. A communication system as claimed in claim 12, characterised in that said address list numbers are stored in a respective mobile subscriber station's telephone number list.

25 14. A communication system as claimed in any of claims 11 to 13, characterised in that a mobile subscriber station is adapted to request from said telephony/Internet server, and said telephony/Internet server is adapted to supply to the mobile subscriber station, a complete listing of the Internet address list.

30 15. A communication system as claimed in any of claims 11 to 13, characterised in that a mobile subscriber station is adapted to search for a specific one of the Internet addresses stored by said telephony/Internet server.

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16. A communication system as claimed in any of claims 11 to 13, characterised in that said telephony/Internet server is adapted, on receipt of a call connection request from a mobile subscriber station to an unlisted Internet address, to:

5 - store, and assign an address list number to, the unlisted Internet address; and

 - send back, to the mobile subscriber station, via SMS, the following information to enable a user of said mobile subscriber station to call said Internet address:

10 - the assigned address list number;

 - the server's telephone number; and

 - information that call connection is possible to the Internet address.

15

17. A communication system as claimed in any one of the preceding claims, characterised in that said cellular radio communication network is a GSM network.

20 18. A method for enabling a mobile subscriber station of a cellular radio communication network to make an Internet telephone call to an Internet user, characterised by the use of SMS to transfer:

 - from said mobile subscriber station to a telephony/Internet server information identifying the Internet address for said Internet user; and

25 - from said telephony/Internet server to said mobile subscriber station, information relating to said connection between said mobile station and said Internet user.

30 19. A method as claimed in claim 18, characterised by said SMS being used to transfer the following information to said telephony/Internet server:

 - the Internet address for an Internet-connected computer terminal of said Internet user; and

- 23 -

- a specific identity for said mobile subscriber station.

20. A method as claimed in claim 19, characterised in that said specific identity of said mobile subscriber station is a telephone number for said mobile subscriber station.

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21. A method as claimed in claim 19, or claim 20, characterised by said telephony/Internet server, on receipt of said SMS-transferred information, using A-number analysis to determine the A-telephone number identity of said mobile subscriber station.

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22. A method as claimed in any of claims 19 to 21, characterised by said telephony/Internet server, in response to receipt of said SMS-transferred information from said mobile subscriber station, sending an SMS to said mobile subscriber station including the following information:

15

- that call connection to said Internet user is possible; and
- the server's telephone number.

20 23. A method as claimed in claim 22, characterised by:

- said mobile subscriber station calling the server's telephone number; and
- said server, on receipt of the call from said mobile subscriber station:

25

- identifying said mobile subscriber station (calling party);
- associating the telephone call with the Internet address previously transferred to said server by said mobile subscriber station; and

30

- connecting the telephone call to the Internet address.

24. A method as claimed in claim 23, when appended to either claim 21, or claim 22,

- 24 -

characterised by said telephony/Internet server identifying said mobile subscriber station (calling party) using said A-number analysis.

25. A method as claimed in claim 24, characterised by associating said Internet address with the A-telephone number of said mobile subscriber station for a specific period of time, and by monitoring said period of time.

5 26. A method as claimed in any of claims 23 to 25, characterised by said telephony/Internet server connecting the telephone call directly to the Internet address.

10 27. A method as claimed in any of claims 23 to 25, characterised by said telephony/Internet server connecting the telephone call to the Internet address via at least one additional Internet server, a server at the end of this chain being adapted to provide Internet telephony services.

15 28. A method as claimed in any of claims 18 to 27, characterised by said telephony/Internet server establishing and storing a list of Internet addresses for each mobile subscriber station user wishing to make Internet telephone calls, and by each one of said Internet addresses having an address list number.

20 29. A method as claimed in claim 28, characterised by said telephony/Internet server, in response to receipt of said SMS-transferred information from said mobile subscriber station, sending an SMS to said mobile subscriber station including the following information:

25 - that call connection to said Internet user is possible;

- the server's telephone number; and

30 - an address list number for the Internet address, each address list number corresponding to one of the Internet addresses in the mobile subscriber station user's address list in the telephony/Internet server.

- 25 -

30. A method as claimed in claim 29, characterised by storing said address list numbers in a respective mobile subscriber station's telephone number list.

5 31. A method as claimed in any of claims 28 to 30, characterised by a mobile subscriber station requesting a complete listing of the Internet address list from said telephony/Internet server.

10 32. A method as claimed in any of claims 28 to 30, characterised by a mobile subscriber station searching for a specific one of the Internet addresses stored by said telephony/Internet server.

15 33. A method as claimed in any of claims 28 to 30, characterised by said telephony/Internet server, on receipt of a call connection request from a mobile subscriber station to an unlisted Internet address:

20 15 - storing, and assigning an address list number to, the unlisted Internet address; and

25 20 - sending back, to the mobile subscriber station, via SMS, the following information to enable a user of said mobile subscriber station to call said Internet address:

25 - the assigned address list number;

30 - the server's telephone number; and

30 - information that call connection is possible to the Internet address.

34. A method as claimed in any one of claims 18 to 33, characterised in that said cellular radio communication network is a GSM network.

30 35. A method for enabling a mobile subscriber station of a cellular radio communication network to make an Internet telephone call to an Internet user, characterised by:

- 26 -

- a user of said mobile subscriber station sending the following information to a telephony/Internet server using SMS:
 - information identifying the Internet address for said Internet user; and
 - the specific identity of said mobile subscriber station (for example, the telephone number for the mobile subscriber station);
- said telephony/Internet server, in response to receipt of said information, sending an SMS to said mobile subscriber station, said SMS including the following information:
 - that connection to said Internet address is possible; and
 - the server's telephone number;
- a user of said mobile subscriber station, on receipt of the SMS from the server, calling the server's telephone number; and
- the server, on receipt of the telephone call from the mobile subscriber station:
 - identifying the calling party (mobile subscriber station) using, for example, A-number analysis; and
 - associating the telephone call with the Internet address previously received in the SMS from the mobile subscriber station; and
 - connecting the telephone call to the Internet address.

30 36. A method for enabling a mobile subscriber station of a cellular radio communication network to make an Internet telephone call to an Internet user, characterised by:

- 27 -

- establishing and storing a list of Internet addresses for each mobile subscriber station user wishing to make Internet telephone calls;
- assigning, for each address in the Internet address list, a number which uniquely identifies these addresses;
- a user of said mobile subscriber station sending the following information to a telephony/Internet server using SMS:
 - information identifying the Internet address for said Internet user, and
 - the specific identity of said mobile subscriber station (for example, the telephone number for the mobile subscriber station);
- said telephony/Internet server, in response to receipt of said information, sending an SMS to said mobile subscriber station, said SMS including the following information:
 - that connection to said Internet address is possible;
 - the server's telephone number; and
 - an address list number for the Internet address, each address list number corresponding to one of the Internet addresses in the mobile subscriber station user's address list in the telephony/Internet server;
- a user of said mobile subscriber station, on receipt of the SMS from the server, calling the server's telephone number;
- the telephony/Internet server, on receipt of the telephone call from the mobile subscriber station, transmitting a voice message to said mobile subscriber station requesting the user to key in an address list number; and

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— when said mobile subscriber station user keys in said address list number, said telephony/Internet server connecting the user of said mobile subscriber station to an Internet user at the Internet address corresponding to the address list number.

5

37. A method as claimed in claim 36, characterised by said telephony/Internet server, in the absence of a response from the Internet user, notifying the user of said mobile subscriber terminal by means of either a voice message, or tones, as in conventional telephony.

10

38. A method as claimed in claim 37, characterised by said notification being that the Internet user is engaged, or is not replying, or does not have an Internet telephony application.

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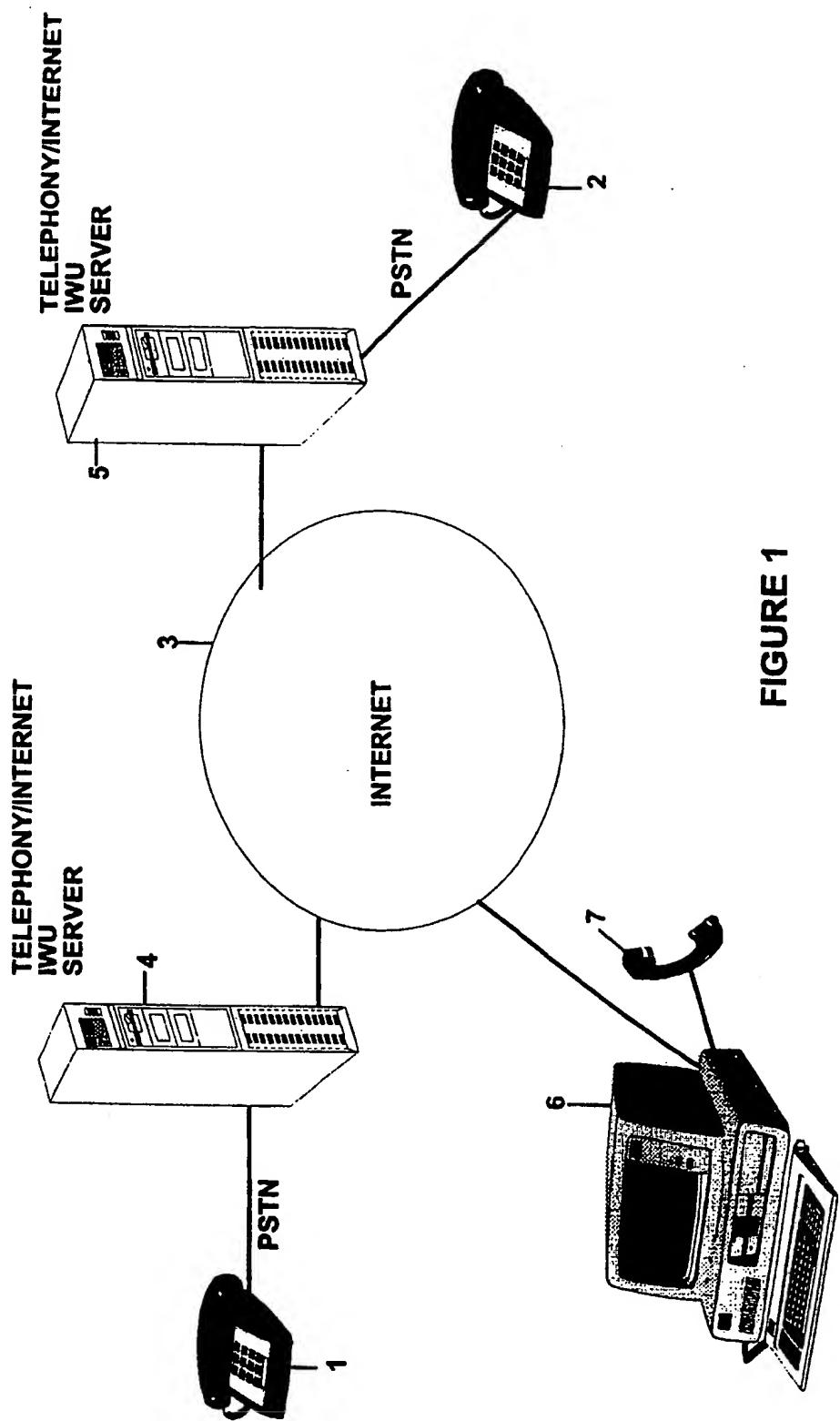


FIGURE 1

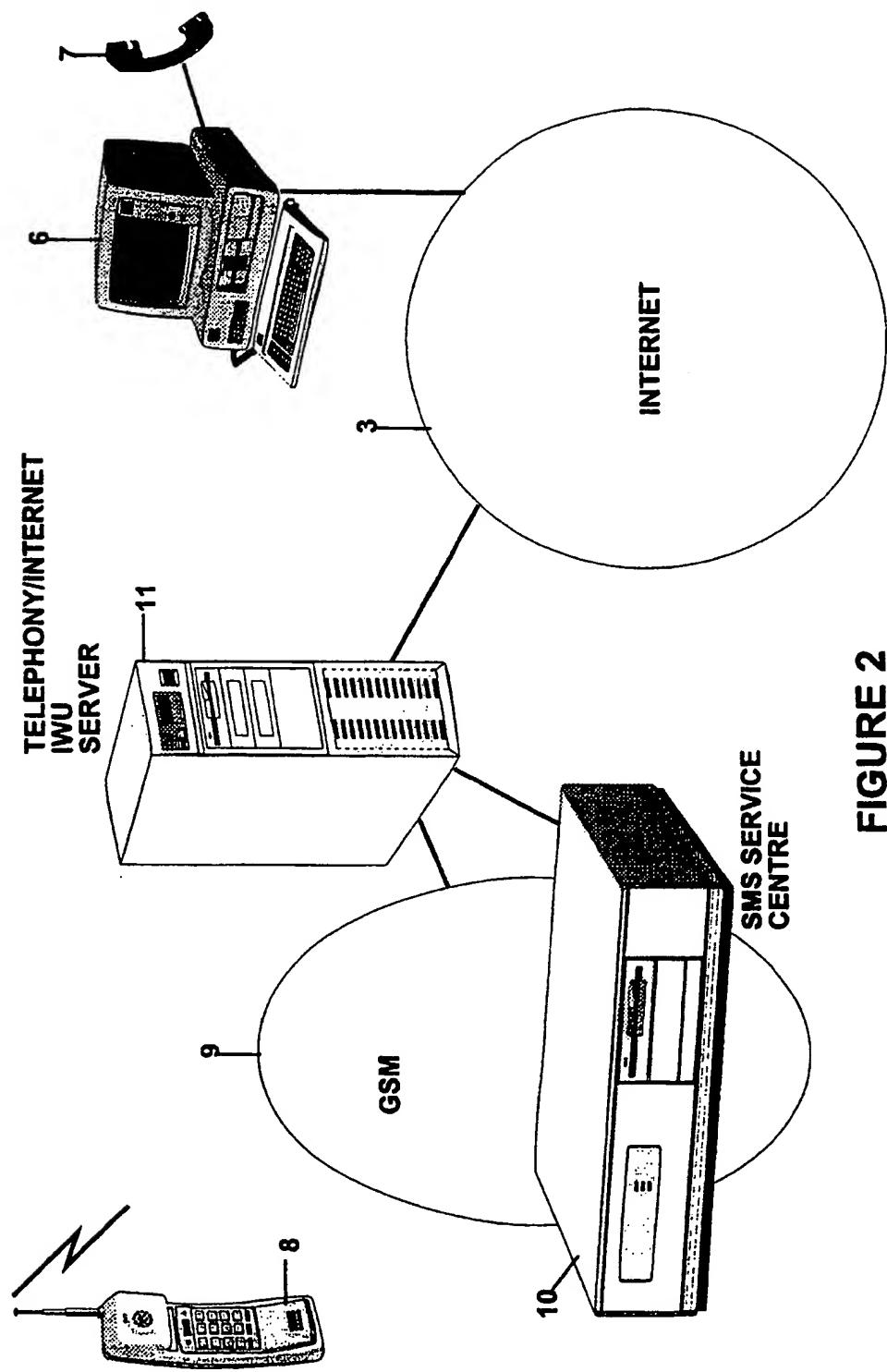


FIGURE 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/01349

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04Q 7/22, H04L 29/06, H04M 7/12 // H04M 3/50
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	EP 0795991 A1 (HEWLETT-PACKARD COMPANY), 17 Sept 1997 (17.09.97), see the whole document --	1, 18, 35, 36
A	WO 9731498 A2 (TELECOM FINLAND OY), 28 August 1997 (28.08.97), abstract, see the whole document --	1-38
A	WO 9713382 A1 (NORTHERN TELECOM LIMITED), 10 April 1997 (10.04.97), page 2, line 21 - page 5, line 2, abstract --	1-38
P, A	WO 9811744 A1 (NOKIA TELECOMMUNICATIONS OY), 19 March 1998 (19.03.98), abstract -- -----	1, 18, 35-36

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier document but published on or after the international filing date	"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

1 December 1998

Date of mailing of the international search report

03-12- 1998

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